



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

August 20–23, 2018
Grand Junction, Colorado

2018 Long-Term Stewardship Conference

The Evolution of Wastewater Treatment at Fernald, Ohio, with Emphasis on the 2015-2018 Optimization Efforts

Bill Hertel

Navarro Research & Engineering, Inc.

Session: Track: 1.1 Advancing current practices at mission
and non-mission sites within the Department of Energy

Contributors

Sue Smiley

DOE Office of Legacy Management

Cathy Glassmeyer

Navarro Research & Engineering, Inc.

Fernald Preserve, Ohio, Site



Fernald Preserve, Ohio, Site



Treatment Facilities — Production (1950-1989)

- Industrial wastewater treatment has been ongoing since a uranium metals refinery was constructed at the site in 1951.
- Initially, the primary purpose of treatment was to recover uranium for reuse – removed uranium down to about 1 part per million



Treatment Facilities — Remediation (1991-2006)

- Industrial wastewater treatment continued throughout site remediation.
 - 3,100 gallons per minute (gpm)
- Groundwater
 - Advanced Wastewater Treatment (AWWT) Phase III (1,800 gpm)
 - South Plume Interim Treatment (200 gpm)
- Storm Water
 - AWWT Phase I (500 gpm)
 - Interim AWWT (300 gpm)
- Remediation Wastewater
 - AWWT Phase II (300 gpm)



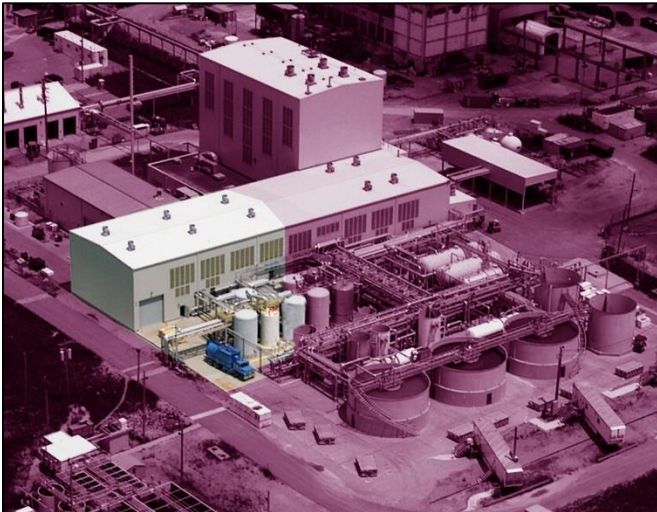
Treatment – What, Why, How

- Treat wastewater, storm water, and groundwater to remove uranium
- Treat as needed to meet site effluent discharge requirements to the Great Miami River
 - “Drinkable” discharge
 - EPA drinking water standard of 30 parts per billion monthly average must be met
 - Total uranium mass not to exceed 600 pounds per year
- Anion exchange resin
 - In surface and groundwater at Fernald uranium exists as negatively charged uranyl carbonate

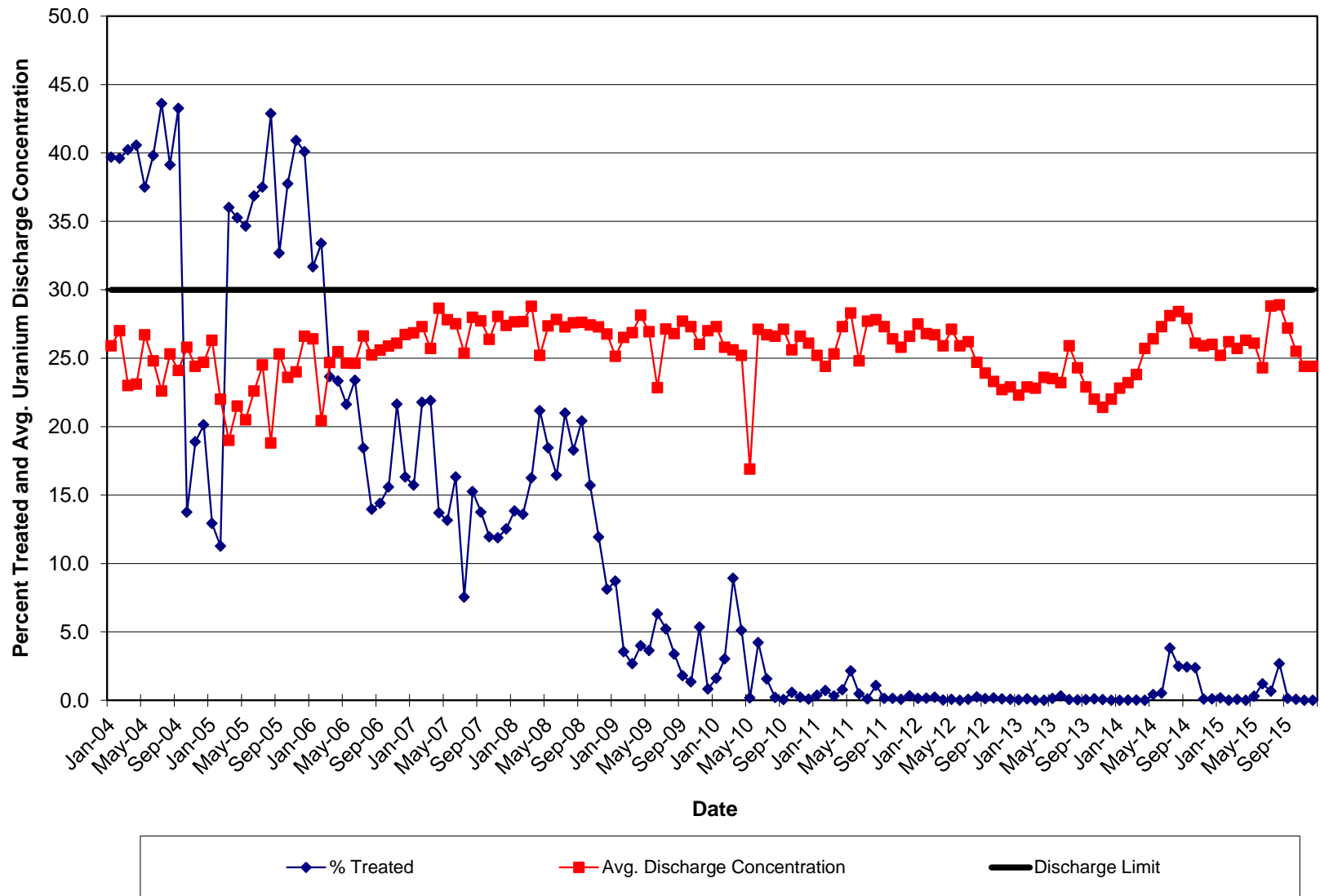


Treatment — Remediation (2003-2005)

- *Groundwater Strategy Report* presented and evaluated options for wastewater treatment post-closure.
- Settled on leaving the AWWT expansion system providing 1,800 gpm treatment capacity to address post-closure needs (mostly groundwater).
- The AWWT expansion system was carved down and “converted” to the Converted AWWT facility.
- CAWWT was commissioned in 2005.



Groundwater Treatment



Treatment — Legacy Management (2011-2015)

- 2011 – DOE, EPA, and Ohio EPA agreed to reduced treatment capacity (1,800 gpm down to 500–600 gpm)
- 2012 – Treatment capacity at CAWWT reduced to 500–600 gpm.
- 2014 – Increasing maintenance led to DOE commissioning a *Facility Condition Assessment*
- 2015 – *Facility Condition Assessment* completed in March
 - Numerous components were at or past design life
 - Numerous components needed replacing
 - Treatment capacity exceeded future capacity needs



Treatment — Stakeholder Involvement (2015)

- April/May: DOE Management
- July: EPA and Ohio EPA
- August: Public



System Optimization

- Detailed project planning started fall 2015
- Four phases:
 - Cleanout and refurbish backwash basin
 - Design the new system
 - Removal and disposal of used media, piping, and tanks
 - Construct, install, and start-up new system



System Optimization

- Backwash basin work was postponed in early 2016 due to funding constraints.
- DOE approved multi-year project March 2016.
- Design contract awarded summer 2016 – completed April 2017.
- D&D contract awarded summer 2016 – completed January 2017.
- Construction contract awarded summer 2017 – construction substantially complete in March with start-up testing in April 2018.



Lessons Learned

- Consistent and frequent stakeholder interaction is key to project success.
- Market conditions, bidding climate, and timing are key factors affecting project cost.
- Rigging in tightly configured locations requires additional work experience for workers performing task.
- Following the Integrated Work Control Process helps ensure work is completed safely.

Contact Information

Sue Smiley, DOE LM
Fernald Preserve Site Manager
10995 Hamilton Cleves Highway
Harrison, Ohio 45030
(513) 648-3333 office
Sue.Smiley@lm.doe.gov



Bill Hertel, Contractor to DOE LM
Fernald Preserve Site Lead
Navarro Research and Engineering, Inc.
10995 Hamilton Cleves Highway
Harrison, Ohio 45030
(513) 648-3894 office
Bill.Hertel@lm.doe.gov

Cathy Glassmeyer, Contractor to DOE LM
Fernald Preserve Site Operations Manager
Navarro Research and Engineering, Inc.
10995 Hamilton Cleves Highway
Harrison, Ohio 45030
(513) 648-5927 office
Cathy.Glassmeyer@lm.doe.gov